

REMARKS

I Disposition of Claims

Claims 1-14, and 16-20 are currently pending. Claims 1-4 are currently amended. Support for the amended claims 1 and 2 can be found throughout the specification, for example in the original claims, page 11, lines 13-20, and page 18, lines 3-4. Also, a typographical error has been corrected in Claim 2. Claims 3 and 4 have been amended for clarity and thus for reasons unrelated to patentability. No new matter has been added.

II Claim Objections

Claim 2 has been objected to because of the misspelling of the word "layer". The claim has been amended to correct this error.

III Novelty

The Examiner has rejected Claims 1-8, 10-14, 17 and 20 under 35 USC 102(b) as anticipated by, or in the alternative, under 35 USC 103(a) as obvious over Bourgois (US 5,883,018). In order to anticipate a claim, the reference must teach every element of the claim. Claims 1 and 2 have been amended as to clarify that it is the *different individual layers* of reinforcement elements that are arranged at an angle with respect to each other, between 1 and 89°.

Bourgois discloses a fabric comprising a plurality of steel cords. The steel cords consist of several steel filaments which form a twisting angle α with the longitudinal axis of the steel cord. The steel cords may be used to form a woven fabric. The fabric may be used as an insert in textiles.

The Examiner specifically referred to Fig. 10 of Bourgois. Fig. 10 shows a fabric which consists of a solid woven structure having two layers of steel cord as warp, and three layers of synthetic filaments or steel cords as weft. The warp and weft layers are bound by means of nylon filaments. As explained below, the fabric disclosed in FIG. 10 and in the remainder of Bourgois differs from the fabric used in a composite as claimed in present claims 1 and 2.

First, the claimed invention refers to a fabric that contains reinforcement elements that "are not interwoven," while Bourgois refers to fabrics that are woven. This can be plainly seen in FIGS. 5 to 10 of Bourgois, where woven structures are shown. Bourgois further explains this structure in the description on column 3, lines 19-23 and column 5, lines 11-12 and lines 32-37.

Secondly, in the presently claimed invention, the "layers of reinforcement elements are superimposed onto each other." The layers are arranged under an angle with respect to each other which differs from 0° and 90° and which is comprised "between 1 and 89° ." In contrast, Bourgois discloses a fabric having different layers that are arranged under an angle with respect to each other which is equal to 90° . More in particular, FIG. 7 of the document for instance discloses a warp and a weft made of steel cord elements which are arranged with respect to one another under an angle of 90° . FIG. 10 of Bourgois illustrates warp layers of steel cords and weft layers of synthetic elements that are arranged with respect to each other under an angle of 90° . In other words, FIG. 10 of Bourgois illustrates two warp layers of steel cords (100) that are arranged with respect to each other under an angle of 0° , and having a weft layer of synthetic filaments in between these two warp layers. In contrast, the presently claimed invention is directed to a fabric having superimposed layers of elements which layers are arranged under an angle with respect to each other which is comprised between 1 and 89° .

Additionally, the claimed invention refers to an angular position of layers of reinforcement elements with respect to each other within a range of $1-89^\circ$, and this within a single fabric. The indicated angle, comprised between 1 and 89° , applied in the claimed invention refers to the position of the layers and not to the position of reinforcement elements in one layer with regard to each other or to individual filaments in one reinforcement element with regard to each other. In Bourgois, the angle α is the twisting angle which denotes the angle between different filaments with respect to each other within a steel cord (see FIG. 1 of Bourgois). This angle may differ from 0 or 90° . However, it is noted that this angle is the angle between the filaments and not between different layers of reinforcement elements. The indicated angle is thus of no relevance with regard to the angular position of the layers in respect with the present invention.

In view of the above, the subject matter of independent Claims 1 and 2, and all the dependent claims, is novel over the disclosure of Bourgois and the anticipation rejection should be withdrawn.

IV Nonobviousness

The Examiner rejected Claims 9, 16, 18 and 19 as obvious over Bourgois alone or in combination with VanderWerf (US 6,517,659) or Applicants' alleged admission of the prior art. However, to establish a prima facie case of obviousness, the prior art reference must teach or

suggest all the claim limitations. (MPEP 2143). As discussed above, several limitations recited in Applicants' presently pending claims are not disclosed in the Bourgois reference. For example, the present invention relates to a fabric that is a non woven fabric having layers of reinforcement elements that are superimposed and arranged with respect to each other under an angle of between 1 and 89°. The Examiner has pointed to nothing in Bourgois, VanderWerf or anywhere elsewhere that would suggest such limitations.

VanderWerf teaches the use of polyester in a puncture resistant fabric. VanderWerf, like Bourgois, does not teach the limitation "individual layers of reinforcement elements are arranged under an angle with respect to each other which is comprised between 1 and 89°". Therefore, there is no motivation to modify the teaching of Bourgois to include this limitation. Thus, no proper prima facie showing of obviousness has been set forth by the cited combination of references.

Furthermore, the present invention provides significant unexpected results that would rebut a prima facie showing of obviousness, even if such a showing were present. By providing layers of elements which are arranged under the indicated angles with respect to each other, a fabric may be obtained that shows improved cutting resistance. Due to the positioning of the layers with respect to each other, the reinforcement elements in the fabric--and thus in the composite--will be able to act as a "group" or a "set" of elements. A major advantage thereof is that different elements are able to simultaneously undergo some displacement, when acting upon by a cutting element. As a consequence, individual elements will less easily be cut through, and cutting resistance of the fabric and composite will be greatly improved. The present invention thus provides a composite having maximal cutting resistance, by enabling the anti-cutting reinforcement elements to act as freely as possible. Such maximal cutting resistance is produced by the mutual positions of the individual layers of elements in which "bundles" or "groups" of individual elements are created before a single element gets cut through.

In addition, the applicant has surprisingly demonstrated that good cutting resistance can be obtained even if the reinforcement elements in the fabric are not interwoven. In the present invention, improved cutting resistance can be assigned to the specific superimposed arrangement of different layers of elements, i.e. in angles ranging from 1 to 89° with respect to each other, as indicated above.

Bourgois remains totally silent on the need of orientating different individual layers of reinforcement elements within one fabric with regard to each other under an angle of 1 to 89° in order to obtain improved cutting resistance. In fact, Bourgois only discloses the orientation of superimposed layers within a fabric under an angle of 90° (see e.g. FIG. 5-7 and 10), and provides no hints to a person of skill in the art that another orientation of the layers would be highly preferred and more appropriate. In addition, Bourgois remains silent on the need of having a fabric of which the reinforcement elements are not interwoven, and only claims woven fabrics for use as stab-resistant inserts in textiles (see e.g. claim 11)

It is hereby further submitted that, in view of the positioning angle of different individual layers of elements, machines used to produce the type of fabric disclosed in Bourgois can not be applied to produce the present fabric. The weft is inserted in an angle different from 90° with regard to the warp in the present invention, and such weft introduction can not be done using a machine adapted to insert a weft under an angle of 90° with regard to the warp, as is done in Bourgois. In order to elaborate and produce fabrics according to the present invention starting from Bourgois, another type of machinery would have to be implemented and applied, which is not straightforward, and requires substantial effects and technical skill. In addition, in view hereof, a person of skill in the art would not be prompted to apply an arrangement of layers of not interwoven reinforcement elements with regard to each other for developing a fabric as in the present invention, especially since also operating devices would have to be adopted for that purpose.

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CONCLUSION

In view of the above, it is submitted that the claims are in condition for allowance. Reconsideration and withdrawal of all outstanding rejections are respectfully requested. Allowance of the claims at an early date is solicited. If any points remain that can be resolved by telephone, the Examiner is invited to contact the undersigned at the below-given telephone number.

Respectfully submitted,

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